Appl. No. 10/550,188
Amdt. Dated October 10, 2008
Reply to Office Action of August 11, 2008

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AMENDMENTS

To the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-34 (Cancelled)

35. (Currently amended) An optical wavelength meter for measuring an optical wavelength of an optical beam comprising:

a) coarse optical filter means and first optical power measurement means for measuring output of the coarse optical filter means and second optical power measurement means for measuring an unfiltered reference beam for coarse wavelength measurement;

b) fine optical filter means comprising first and second periodic optical filters in quadrature having a finesse of substantially 2 and free spectral range of substantially 100 GHz, such that peaks and troughs of the first filter coincide with substantially linear ranges between peaks and troughs of the second filter, and third and fourth optical power measurement means for measuring output of the first and second periodic optical filters in quadrature for fine wavelength measurement, respectively;

c) beam splitting means for splitting the optical beam between the unfiltered reference beam and the coarse and fine optical filter means;

d) synchronized clock signal measurement means for synchronized measurement of the output of the first, second, third and fourth optical power measurement means; [[and]]

e) processing means for determining the optical wavelength of the optical beam from a predetermined transmissivity-wavelength relationship of the coarse filter and the first and second optical power measurement means for coarse wavelength measurement and from predetermined transmissivity-wavelength relationships of

the first and second periodic optical filters and at least one of the third and fourth optical power measurement means for fine wavelength measurement; and

f) calibration filter means comprising an etalon filter and calibration filter output power measuring means;

wherein free spectral range of the etalon filter differs just sufficiently from the free spectral range of the periodic optical filters that the etalon filter is in phase only at top, middle and bottom wavelengths of a range of measurements of interest to obtain co-incident or Vernier-like maximum power at those wavelengths.

36. (Previously presented) An optical wavelength meter as claimed in claim 35, wherein the coarse optical filter means comprises a linear spectral filter.

37. (Previously presented) An optical wavelength meter as claimed in claim 35, wherein the coarse optical filter means comprises a dielectric multilayer coating on a glass substrate.

38. (Previously presented) An optical wavelength meter as claimed in claim 35, wherein the periodic optical filters comprise at least one of a Fabry Perot filter, a Fizeau filter, a fibre Bragg grating and a photonic crystal.

39. (Previously presented) An optical wavelength meter as claimed in claim 35, wherein a phase offset between the first and second periodic optical filters in quadrature is tuned by angle, temperature or pressure using a piezoelectric transducer.

40. (Previously presented) An optical wavelength meter as claimed in claim 35, wherein reflectivity of the periodic optical filters is substantially 25%.

41. (Previously presented) An optical wavelength meter as claimed in claim 35, wherein the periodic optical filters have a free spectral range of substantially 50 GHz instead of substantially 100 GHz.

42. (Previously presented) An optical wavelength meter as claimed in claim 35, wherein the periodic optical filters are parallel or wedge quartz etalons.

43. (Cancelled).

44. (Cancelled).

45. (Currently amended) An optical wavelength meter as claimed in claim [[44]] 35, wherein the etalon filter has precisely set or controllable free spectral range.

46. (Previously presented) An optical wavelength meter as claimed in claim [[44]]] 35, wherein the free spectral range of the etalon filter is controllable and preset by rotation adjustment or temperature.

47. (Cancelled).

48. (Previously presented) An optical wavelength meter as claimed in claim 35, wherein at least one of the optical power measurement means comprises a photodiode.

49. (Previously presented) An optical wavelength meter as claimed in claim 35, wherein the synchronised clock signal measurement means comprises master module and slave modules to trigger measurement and read output of the optical power measurement means.

50. (Previously presented) An optical wavelength meter as claimed in claim 49, wherein the synchronised clock signal measurement means enables 40,000 points on each of a plurality of channels to be read in 2.5 seconds.

51. (Previously presented) An optical wavelength meter as claimed in claim 35, wherein, the synchronised clock signal measurement means enables 1,000 to 10,000 wavelength measurements/second.

52. (Previously presented) An optical wavelength meter as claimed in claim 35, having a precision of substantially 2 picometers or substantially 250 MHz.

53. (Previously presented) An optical wavelength meter as claimed in claim 35, arranged to make wavelength measurements in at least one of optical C-band, optical L-band and optical S-band.

54. (Previously presented) An optical wavelength meter as claimed in claim 35, further comprising temperature control means for stabilising optical components thereof.

55. (Previously presented) An optical wavelength meter as claimed in claim 54 wherein the temperature control means comprises a thermistor or thermocouple and fan cooling or Peltier temperature elements.

56. (Previously presented) An optical wavelength meter as claimed in claim 35, adapted for external triggering for synchronisation with external instrumentation.

57. (Previously presented) An optical wavelength meter as claimed in claim 35, arranged to measure infrared or visible wavelengths.

58. (Currently amended) A method of determining wavelength of an optical beam comprising:

a) splitting the optical beam into first, second, third and fourth sub-beams;

b) presenting the first sub-beam to reference first photodetector means;

c) presenting the second sub-beam to coarse filter means having an output to second photodetector means;

d) presenting the third sub-beam to a first fine periodic filter having an output to third photodetector means;

e) presenting the fourth sub-beam to a second fine periodic filter having an output to fourth photodetector means, wherein the first fine periodic filter and the second fine periodic filter are in quadrature and have a finesse of substantially 2 and free spectral range of substantially 100 GHz, such that peaks and troughs of the first

fine periodic filter coincide with substantially linear ranges between peaks and troughs of the second fine periodic filter;

f) using synchronized clock signal measurement means to read outputs from the first, second, third and fourth photodetector means;

g) identifying from predetermined transmissivity-wavelength characteristics of the coarse filter means and the first and second photodetector means outputs a limited range of wavelength in which the wavelength of the optical beam lies, to determine from their predetermined transmissivity-wavelength sensitivities which of the first fine filter and the second fine filter has a greater sensitivity to wavelength in that limited range; [[and]]

h) using predetermined transmissivity-wavelength characteristics of the first or second fine filter having the greater sensitivity in the limited range of wavelength and the corresponding third or fourth photodetector means output, corresponding to the fine filter means having the greater sensitivity, to determine the wavelength of the optical beam;

i) providing a calibration etalon filter with conventional Airy function transmitting only at a reference wavelength for calibration having a common maximum with the first and second fine periodic filters respectively at a limited number of wavelengths within range;

j) providing a broadband light source or a tuneable laser tuned to the reference wavelength; and

k) calibrating the processed readout from fine periodic filters to the reference wavelength of the calibration etalon filter.

59. (Cancelled).

60. (Cancelled).

61. (Currently amended) A method as claimed in claim [[59]] 58, wherein step [[(a)]] i) additionally comprises providing a fourth Airy etalon in ratio with the calibration etalon filter with conventional Airy function to provide a common maximum at the limited number of wavelengths for a more defined optical transmitted bandwidth.

62. (Previously presented) A method as claimed in claim 58, for measuring infrared or visible wavelengths.

63. (Cancelled).

64. (Previously Presented) An optical wavelength meter for measuring an optical wavelength of an optical beam comprising:

a) coarse optical filter means and first optical power measurement means for measuring output of the coarse optical filter means and second optical power measurement means for measuring an unfiltered reference beam for coarse wavelength measurement;

b) fine optical filter means comprising first and second periodic optical filters in quadrature having a finesse of substantially 2 and free spectral range of substantially 100 GHz, such that peaks and troughs of the first filter coincide with substantially linear ranges between peaks and troughs of the second filter, and third and fourth optical power measurement means for measuring output of the first and second periodic optical filters in quadrature for fine wavelength measurement, respectively;

c) beam splitting means for splitting the optical beam between the unfiltered reference beam and the coarse and fine optical filter means;

d) synchronized clock signal measurement means for synchronized measurement of the output of the first, second, third and fourth optical power measurement means;

e) processing means for determining the optical wavelength of the optical beam from a predetermined transmissivity-wavelength relationship of the coarse filter and the first and second optical power measurement means for coarse wavelength measurement and from predetermined transmissivity-wavelength relationships of the first and second periodic optical filters and at least one of the third and fourth optical power measurement means for fine wavelength measurement; and

f) calibration filter means and calibration filter output power measuring means, wherein the calibration filter means comprises an etalon filter.

wherein free spectral range of the calibration etalon filter differs just sufficiently from the free spectral range of the periodic optical filters that the calibration etalon filter is in phase only at top, middle and bottom wavelengths of a range of measurements of interest to obtain co-incident or Vernier-like maximum power at those wavelengths.

65. (Previously Presented) A method of determining wavelength of an optical beam comprising:

a) splitting the optical beam into first, second, third and fourth sub-beams;

b) presenting the first sub-beam to reference first photodetector means;

c) presenting the second sub-beam to coarse filter means having an output to second photodetector means;

d) presenting the third sub-beam to a first fine periodic filter having an output to third photodetector means;

e) presenting the fourth sub-beam to a second fine periodic filter having an output to fourth photodetector means, wherein the first fine periodic filter and the second fine periodic filter are in quadrature and have a finesse of substantially 2 and free spectral range of substantially 100 GHz, such that peaks and troughs of the first

fine periodic filter coincide with substantially linear ranges between peaks and troughs of the second fine periodic filter;

f) using synchronized clock signal measurement means to read outputs from the first, second, third and fourth photodetector means;

g) identifying from predetermined transmissivity-wavelength characteristics of the coarse filter means and the first and second photodetector means outputs a limited range of wavelength in which the wavelength of the optical beam lies, to determine from their predetermined transmissivity-wavelength sensitivities which of the first fine filter and the second fine filter has a greater sensitivity to wavelength in that limited range; and

h) using predetermined transmissivity-wavelength characteristics of the first or second fine filter having the greater sensitivity in the limited range of wavelength and the corresponding third or fourth photodetector means output, corresponding to the fine filter means having the greater sensitivity, to determine the wavelength of the optical beam;

i) providing a calibration etalon filter with conventional Airy function transmitting only at a reference wavelength for calibration having a common maximum with the first and second fine periodic filters respectively at a limited number of wavelengths within range;

j) providing a broadband light source; and

k) calibrating the processed readout from fine periodic filters to the reference wavelength of the calibration etalon filter.

66. (Currently amended) A method as claimed in claim 65, wherein step b) ~~alternatively~~ comprises providing <u>one of either a broadband light source or</u> a tuneable laser tuned to the reference wavelength.

67. (Currently amended) A method as claimed in claim 65, wherein step a) additionally comprises providing a fourth Airy etalon in ratio with the ~~third Airy~~ calibration etalon filter with conventional Airy function to provide a common maximum at the limited number of wavelengths for a more defined optical transmitted bandwidth.